

NOTES ON ALASKAN COLLEMBOLA
I. A NEW GENUS AND SPECIES OF
THE FAMILY ISOTOMIDAE¹

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This is the first in a series of papers on the Collembola fauna of northern Alaska. The material on which this paper is based was collected by Dr. Neal A. Weber while holding a contract with the Office of Naval Research and while stationed in the Alaskan Arctic under the support of the Arctic Research Laboratory.

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Weberacantha, n. gen.

Anurophorini, facies superficially proisotomid. Body somewhat elongate. Head prognathous, slightly narrower than second thoracic segment; antennae four-jointed, fourth joint about twice as long as third and slightly swollen, without retractile apical bulb, and with well-developed blunt olfactory setae; eyes eight on each side on a pigmented field; P.A.O. elongate, elliptical, with flap-like margins.

First thoracic segment reduced, not imbricate. All other body segments clearly imbricate. No marked ankylosis of abdominal segments. Sometimes division between fifth and sixth segments obscure; all other intersegmental membranes clearly visible. Fourth abdominal segment distinctly longer than third, and longer than fifth and sixth taken together. Sixth abdominal segment downwardly skewed from fifth, and almost completely hidden by the latter when viewed from above. Fifth abdominal segment dorsally with a number of short stout spines. Anus ventrally directed. Furcula

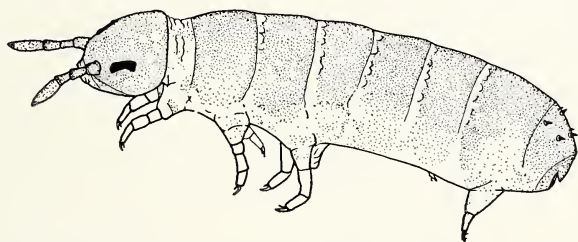
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with mucro, dens, and manubrium all distinct. Manubrium ventrally with a few large setae, dorsally with many short setae; dens dorsally with a few broad humps, and a few scattered setae; mucro with several teeth. Dens about twice as long as mucro. Rami of tenaculum quadridentate, corpus with a single stout seta. Legs stout; tibiotarsus possessing minute distal subsegment; claw simple, all feet with well-developed empodial appendage. Externally at the base of each leg a single large, straight seta; on legs two and three there are in addition two slightly smaller curved setae.

Integument finely reticulate, that is, possessing a network of thin, flat ridges, with the intervening areas slightly depressed. Head, antennae, and imbricate areas of the abdomen and thorax well pigmented, with scattered pale spots. Intersegmental membranes, legs, and furcula unpigmented. Clothing of smooth, short, slightly curved and appressed setae; a few longer, upright setae on the sides and posterior regions of the body. Bothriotrichia absent.

Weberacantha octa, n. sp.

Holotype. Pigment blue with scattered white spots, larger and more numerous on the head and anterior borders of segments than elsewhere. Intersegmental membranes, legs, and dentes white. First thoracic segment white, with



Text-figure 1: *Weberacantha octa*, habitus, holotype (setae omitted).

scattered pigmented areas. Antennae slightly paler than body; anal spines and mucro yellow. Reticulations on the imbricate areas of the thorax and abdomen more or less uniform, those on the head region being slightly larger and more irregular in shape; reticulations of intersegmental

membranes, first thoracic segment, and body appendages distinctly smaller, in many cases so small as to be indistinguishable from granulation. Fourth antennal segment with roundly conical apical projection; a distinct subapical pit with a small spherical papilla on a short stalk; numerous blunt sensory hairs of varying lengths starting just below the level of the subapical pit and continuing about three-fourths of the length of the segment. These hairs are of two lengths, the larger being about twice as large and somewhat thicker than the smaller ones. The distal and proximal hairs are all of the smaller type. Between these limits both types occur, rather irregularly scattered among numerous pointed hairs, the larger, blunt hairs being more numerous than the smaller. Sense organ of third antennal segment consists of two short, slightly swollen, erect rods set in shallow connecting pits, and with two longer, blunt guard hairs, one directly internal of the rods, the other positioned somewhat below and to outer side of the rods. Remainder of clothing of third antennal segment consists of four irregular transverse rows of more or less curved, pointed setae about twice the length of the guard hairs. Second antennal segment, three such rows, plus a single pair of very small pointed setae dorsal on the base of the segment. First antennal segment with one row of normal setae and ventrally about midway in the segment two short blunted setae set in shallow depressions. The outer of these is somewhat less than half the length of the normal pointed setae, and about twice as large as the inner blunt seta of that segment. Eyes eight on each side, on an elongated pigment spot which is somewhat attenuated in the middle. The two inner posterior eyes smaller than the rest. P.A.O. with flap-like margin especially marked on anterior edge, which is indented at about the middle.

Clothing of many short stout setae, smooth and mostly curved, so as to be pointing posteriorly. Setae on head mostly uniformly short, curved rearward. Head with a set of four slightly longer setae directly along the posterior margin of the P.A.O., curved forward so as to overhang the P.A.O.; a few scattered short, straight setae also present, mostly along the posterior and lateral margins of the head.

Longer straight erect setae (two to three times as long as the normal setae) positioned as follows: second thoracic segment with a pair, one near each anterior lateral corner of the imbricate area; third thoracic segment with a similar pair, more posterior in position; abdominal segments 1 and 2 with a median lateral pair of somewhat shorter setae; abdominal segment 3 with a median transverse row of four setae, with the more lateral setae being longer; abdominal segment four with an anterior and a posterior row of four setae each, with the more lateral setae again being the longer, anterior row of long setae about one-third of the way back from anterior border of the segment and the second row of somewhat shorter setae just before the posterior border of the tergite; on the fifth segment a single median transverse row of setae; and sixth segment with four long setae and numerous short straight ones. Fifth abdominal segment dorsally with eight small spines on short papillae, arranged in two transverse rows of four each.

A very small internal tooth is visible about midway up on the first pair of claws. No other teeth present. Empodial appendage stout, acuminate, with a broadly rounded inner lamella, and a well-developed apical filament.

Manubrium with two ventral setae near the bases of the dentes and dorsally with twenty straight smooth setae arranged in two irregular double rows, confluent basally, then running down the outer sides of the manubrium so as to leave a distal, central, triangular, naked area. Dens dorsally with a single low, broad hump and five setae, positioned as follows: one at base of the dens, three forming a centrally positioned triangle, and a fifth short curved setae ventrally just before the mucro. Dens abruptly narrowed at the end and distinctly wider than the mucro. Mucro distinctly separated from dens, tridentate, slightly curved and somewhat larger basally. Basal tooth distant from the apical and subapical teeth. Subapical tooth pointed upward and distinctly larger than the apical and basal teeth which are subequal. Apical tooth pointed forward and only slightly curved. Genital plate of male simple, not clearly demarcated, and

lacking setae. Two large setae are present near each lateral edge, and a pair of small setae near the anterior border.

VARIATION

The P.A.O. of some specimens shows no indentation in the anterior margin, while others have both anterior and posterior margins indented. The flap-like nature of the anterior margin can be seen in all specimens, although sometimes only with difficulty.

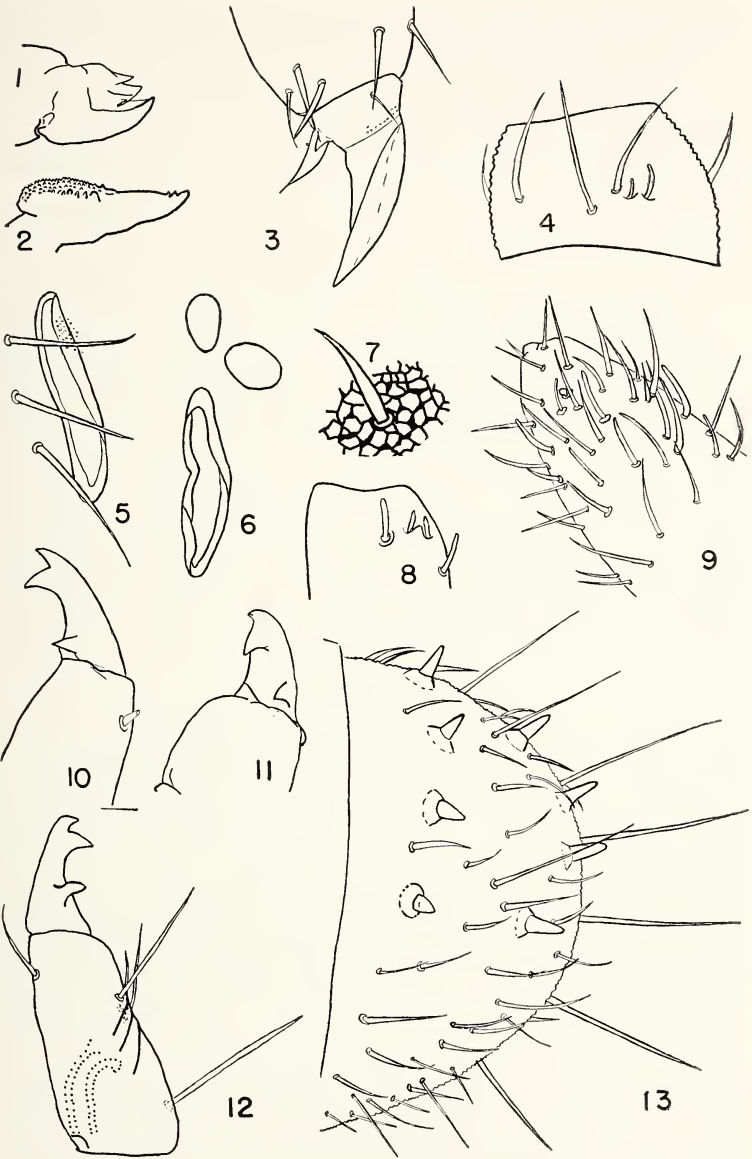
In some specimens the pigmented patch bearing the eyes is so constricted in its central portion as to give the effect of two separate patches.

In a few cases the second antennal segment has more than a single small seta at its base, as many as three having been observed.

The straight setae on the body vary somewhat. There is often present a single transverse row of short erect and straight setae on the second and third thoracic and on the first abdominal segment. These rows vary in their position, and one or more of them may be lacking. The long straight setae vary somewhat in number, some specimens having none on the first abdominal segment and only one pair on the third abdominal segment. The median pairs on the third and fourth abdominal segments may not be erect and are often only slightly longer than the common setae.

EXPLANATION OF PLATE 3.

Weberacantha octa. Magnifications are approximate. Fig. 1. Right maxilla of paratype seen from above (900 X). Fig. 2. Right mandible of paratype seen from above (900 X). Fig. 3. Right hind claw of holotype (800 X). Fig. 4. First antennal segment of holotype, ventral view (800 X). Fig. 5. Left postantennal organ of holotype seen from above (800 X). Fig. 6. Left postantennal organ and anterior ocelli of paratype seen from above (800 X). Fig. 7. Single cephalic seta of paratype, showing the surrounding integumentary reticulations (900 X). Fig. 8. Sense organ of the right, third antennal segment of holotype seen from above (800 X). Fig. 9. Apical region of the fourth antennal segment of paratype seen from above (800 X). Fig. 10. Left mucro of holotype, external view (800 X). Fig. 11. Left mucro of paratype seen from above and slightly to one side (800 X). Fig. 12. Left dens and mucro of paratype, external view (800 X). Fig. 13. Posterior portion of abdomen of paratype seen from above and slightly to one side (350 X).



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The low, broad humps on the dorsum of the dentes may be as many as three in number or they may be absent, and the short ventral seta is often reduced, or (rarely) absent.

The apical tooth of the mucro and the apical filaments of the empodial appendages are often broken off so as to give a truncate appearance to these structures. The very small internal tooth on the first pair of claws may be absent in some specimens.

RELATIONSHIPS

The general appearance and structure of the furcula of this species gives it a superficial resemblance to the *brevi-dens* group (Stach, 1947) of the genus *Proisotoma*; however, the reticulate integument, ventrally directed anus show that it is in reality allied to the tribe Anurophorini. Of the genera in this group it would appear to be most closely related to *Isotomodes* (Axelson, 1907), *Cryptopygos* (Willem, 1902), and *Subisotoma* (Stach, 1947). The body form and segmental ratios appear to be closest to *Subisotoma*, but the reticulate integument and presence of anal spines serve to separate it from all three genera.

MEASUREMENTS

The pattern for measuring used in this paper requires some explanation. The only absolute measurements given are those of the holotype. All other measurements are given in the form of ratios. These ratios are taken for each tag-matal group as a comparison of all parts involved to one part, which is considered as a standard number, i.e., 10. Then the average deviation of each of the non-standard ratio numbers is calculated. It is hoped that this will make for easier comparison, as well as give some idea of the variation involved. In all cases, the ratios were taken from those specimens within the given size range, and, because of the heterogonic growth of these animals, can only be applied to specimens of similar size. All individual segmental measurements are those only of the imbricate or setaceous area, eliminating the highly variable intersegmental membranes. The total size measurements, however, included these parts.

Holotype measurement (in mm.). Total length (excl.

antennae) — 1.26, cephalic diagonal — .26, thoracic segment 2 — .17, seg. 3 — .15, abdominal seg. 1 — .12, seg. 2 — .12, abdmn. seg. 3 — .12, abdmn. seg. 4 — .17, abdmn. seg. 5 — 10, abdmn. seg. 6 — .05, antennal segment 1 — .03, ant. seg. 2 — .04, ant. seg. 3 — .04, ant. seg. 4 — .08, unguis 1 — .026, empodial appendage 1 — .012, unguis 3 — .031, emp. app. 3 — .015, manubrium — .08, dens — .04, mucro — .026.

Segmental ratios for size range 1.18 — 1.30 mm.:

		(standard, thoracic segment 2=10)							
		cephalic diagonal		thoracic segment		abdominal segment			
		2	3	1	2	3	4	5	6
mean ratio	14.9	10	3.8	6.4	6.7	7.1	9.6	5.3	2.2
average deviation	.5	X	.4	.3	.3	.3	.4	.3	.4
		(standard, antennal segment 4=10)							
		antennal segment							
		1	2	3	4				
mean ratio		3.5	5.7	5.5	10				
average deviation		.2	.2	.2	X				
		(standard, unguis 3=10)							
		unguis		empodial appendage					
		1	3	1	3				
mean ratio		9.1	10	4.2	4.5				
average deviation		.7	X	.4	.3				
		(standard, manubrium=10)							
		manubrium		dens	mucro				
		10	4.9	3.0					
mean ratio		X	.3	.3					
average deviation		X	.3	.3					

Type locality: 68°, 20' N., 151°, 30' W., Anaktuvuk, Alaska, July 7, 1949. The holotype (mounted on a slide in Salmon's mixture) and seven paratypes are being deposited in the United States National Museum, Washington, D.C. Five paratypes are being deposited in the Museum of Comparative Zoology, Cambridge, Mass.

This species has also been taken by Dr. Marie Hammer from Mount Richardson, just west of the Mackenzie Delta in Arctic Canada.

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